ways and means may be found to make it more advantageous to all than in the past. It is believed that under the proposed reorganization, it would be highly advantageous to include in the general scheme of affiliation all specialists' societies whose standard of membership is sufficiently high to conform to the requirements of the Society of Naturalists.

To further identify our interests with those of the specialists' societies, it is proposed that all matters of cooperation shall be dealt with by the executive committee, which shall be selected with a view to the establishment of such external relations. This phrase might well be interpreted to mean that each affiliated society shall have its chosen representative on the executive committee of the Naturalists, thereby ensuring the only relation between the several societies through which it will be possible to secure solidarity and identity of interests through cooperation.

It is designed to redefine the general policy in such a manner as to readjust it more definitely to the encouragement of research in the larger fields of science. It should be one of the first objects of our most earnest endeavor to secure a permanent fund which should be devoted to the encouragement of research by any properly qualified investigator within the limits of the United States and Canada, but the subject of investigation should fall within the field occupied by one of the affiliated societies.

The central idea of the society should find expression in some one line of endeavor which makes for the general progress of scientific thought. Of all the societies enumerated, which may be fittingly associated with the Naturalists, there is not one whose work may not be regarded as comprised in general biology, or as having an important collateral bearing upon that science. Whether expressed through the medium of the botanist, zoologist, physiologist or anatomist; through the more indirect channel of the anthropologist and the folklorist; or through the yet less direct channel of the chemist, the geologist or the physicist, the development of the earth, organic life and even thought itself, is the underlying motive for all. Evolution is, therefore, a great central idea which appeals to all investigators of natural phenomena, and this subject is suggested as one which should be the chief endeavor of the parent body.

In order to give working effect to this idea, it is proposed that each year original contributions dealing with one or more aspects of evolution should be presented to one or more meetings of the Society of Naturalists. Furthermore, it is regarded as desirable that there should be a presentation, annually, of reports upon the most important of recent works dealing with evolution. Both reports and the special contributions should be entrusted to men eminent in their respective fields of research. To occupy a position of this kind should imply a compliment.

It is believed that a general policy, wisely carried out, which keeps alive the enthusiasm for research in the ways indicated, would not only constitute a strong bond of union between the members of the entire organization, making for solidarity of interests, but that it would enlist the sympathy and cooperation of the younger generation of scientists.

D. P. Penhallow

McGill University

George Washington Hough

On New Year's morning, at about ten o'clock, occurred the sudden and unexpected death of Dr. George W. Hough, director of the Dearborn Observatory, at Evanston, Ill. Death came suddenly and painlessly to him, in the way that he had always hoped for it,

after he had come to fulness of years without any break in his intellectual vigor.

He was born at Tribes Hill, N. Y., on October 24, 1836. His ancestors on both sides were German, and old settlers in the Mohawk Valley, the first Hough having come to this country in 1730 from Würtemburg.

Professor Hough was a born astronomer, and grew up filled with the idea of following that profession; it is said that at nine years of age he constructed a contrivance from fish-poles for measuring the right ascension of a star. His mechanical genius, which he inherited from his father, also became manifest about this time, and he harnessed up a small brook to do his mother's churning.

After completing the course in the graded schools and the Seneca Falls Academy, he entered Union College at Schenectady, N. Y., where he graduated in 1856 with high honors.

After graduation he became principal of the first ward school in Dubuque, Iowa, where he remained until 1858, when he entered Harvard University for post-graduate work, taking the degree of A.M. in 1859. The same year he became assistant astronomer at the Cincinnati Observatory.

In 1860 he went to the Dudley Observatory at Albany, N. Y., as assistant astronomer, and two years later was appointed director, which position he held until 1874. It was at the Dudley Observatory that a large amount of his valuable work was done.

His astronomical work consisted largely in the observations of the declination of stars compared with Mars, observations of the planet Neptune, and of asteroids, and observation of Nautical Almanac stars, standard zone stars and small planets.

He invented at this time a machine for cataloguing and charting stars, the principle of which depends on the magnifying by mechanical means the angular motion of the telescope.

In 1867 he began work on the measurement of Struve's list of close double stars, and during the same year made a long series of investigations to determine the amount of the personal equation in transit observations. He made, besides, valuable observations on the rate of the sidereal clock, and the compensation of the pendulum.

A large part of his time and attention at the Dudley Observatory was given to meteorological work, and in 1865 he invented his recording and printing barometer. The principle of this instrument consists in the transmission of changes in the level of the mercury, by a float resting on the surface of the mercury in the short arm of a syphon barometer. The movements of the float are transmitted by electricity to the moving parts of the mechanism, which repeat this motion and record it. His reports show that more than 50,000 barometer observations were made with this machine in five years. He was awarded a gold medal for this instrument at the Centennial Exhibition in Philadelphia in 1876, and many years later he received a medal for the same instrument at the World's Fair in Chicago in 1893.

Another machine invented at this time was the meteorograph, a machine of simpler construction, which registered hourly the barometer and wet-and-dry-bulb thermometers. Several of the two machines mentioned above were constructed for the United States government.

He also invented an automatic anemometer, which records the velocity of the wind in the form of a curve, prints the results hourly in miles, and also gives the direction, electricity being used as the active agent. He published a long series of observations made with this machine, and was one of the first to point out the intimate connection between atmospheric pressure and the direction of the wind.

Besides these instruments, he invented the first horizontally-driven machine-saw, and also began work on his printing chronograph. He was an expert mechanic, and did all the work on his machines with his own hands.

In 1868 he made a long series of investigations on the Daniel or gravity battery, and was the first to show that lead may be advantageously substituted for copper as the negative plate. He also showed that the substitution of a cell of leather 0.06 inch thick in place of the porous clay cell in the battery produced double the amount of current. Moreover, that the quantity of electricity

flowing in the external circuit depends on the specific gravity of the zinc sulphate, and that polarization in the battery is caused by the saturation of the zinc sulphate.

He made important investigations concerning the velocity of the electric current, and showed that the apparent velocity is directly proportional to the magnetic force of the circuit, but the real velocity can not be measured.

In 1869 he was chief of an expedition of astronomers sent to Matoon, Ill., to observe the total eclipse of the sun.

In 1870 he was married to Emma C. Shear, daughter of Jacob H. Shear, of Albany, N. Y.

He was elected an honorary member of the German Astronomical Society in 1871. Almost from the beginning of his professional career he took an active part in the meetings of the American Association for the Advancement of Science, and was at one time vice-president.

In the year 1879 he was appointed director of the Dearborn Observatory at Chicago and professor of astronomy in the old Chicago University. His work at once brought Dearborn Observatory into special prominence among the leading observatories of the world.

It was then that he began his systematic study of the planet Jupiter, and this series of observations was continued without interruption for thirty years till the time of his death. These observations included a careful study by micrometer measurements of all the jovian phenomena, especially of the great red spot and the equatorial belts, and made Professor Hough justly famous in the latter days of his life as the greatest authority for that planet. The details and results of these investigations are to be found in the various annual reports of the Chicago Astronomical Society, and in numerous pamphlets published after he came to Evanston.

He also made observations of the satellites of Uranus, and discovered a few new nebulæ. During the first few years in Chicago he was associated in his work with Professor Colbert and Professor Burnham.

In 1882 he took up the study of difficult double stars, and is credited with having discovered over 600 pairs, most of them beyond the reach of any but the most powerful telescopes, which gave him the distinction of having discovered more double stars than any other astronomer of his time.

While in Chicago he perfected his printing chronograph, an instrument which is coming into general use in observatories. He also invented an observing seat for the equatorial, which has been adopted by all the leading observatories.

He became interested in the Chicago Academy of Sciences, and served one term as vice-president of that institution.

In 1887 the Dearborn Observatory was moved to Evanston and became part of the Northwestern University. Professor Hough came with it as director, and as professor of astronomy in Northwestern University. During his twenty-one years' residence in Evanston he accomplished a large part of his important work on Jupiter and double stars.

In 1888 he invented a new astronomical dome, superior to anything else of the kind. His inventions here include an absolute sensitometer for testing photographic plates in various kinds of light, an electrical control for the equatorial, an improved form of storage battery combining durability and low cost, a transmission dynamometer for use with the electric motor, and a new and improved form of photographic plate-holder.

In 1891 he received the honorary degree of doctor of laws from Union College, and about the same time was elected a member of the British Astronomical Association. At the World's Congress in Chicago in 1893 he was president of the mathematical and astronomical section. In 1903 he was elected an associate member of the Royal Astronomical Society of England. He was also a member of the Astronomical Society of the Pacific, the Astronomical and Astrophysical Society, the American Philosophical Society, the American Institute of Civics, the Chicago Photographic Society and the Trinity Historical Society of Texas, and at one time a member of the Albany Institute, the Chicago Lantern Slide Club and the Chicago Electrical Society.

In character Professor Hough was quiet

and unassuming, but of an affectionate, genial disposition, and was greatly beloved by all who knew him. His learning and knowledge were vast, and very wide in their scope. He never spoke hastily nor too much, and his opinion on a subject was always worth having. In my long association with him I have often felt the truth of Emerson's words: "Converse with a mind that is grandly simple, and literature looks like word catching."

The sudden death of this great and good man came as an irreparable loss not only to the community but to the whole scientific world.

GEORGE J. HOUGH

DINNER TO PROFESSOR RAMSAY WRIGHT

THE old pupils and colleagues of Professor Ramsay Wright, of the University of Toronto, joined in celebrating the completion of his thirty-fifth year of service in the university by tendering him a complimentary banquet and address on April 15. The chair was taken by Professor J. Playfair McMurrich, the toast to the university was proposed by Professor F. R. Lillie, of the University of Chicago, that to the guest of the evening by Dr. T. MacCrae, of the Johns Hopkins University, and the address was presented by Professor A. B. Macallum. A number of letters from distinguished colleagues of other universities were read, all of which bore ample testimony to the value of the services rendered by Professor Wright in the development of the biological sciences in Canada, in the elevation of the standards of medical education and in the constant maintenance, both by example and precept, of the highest ideals of scholarly attainments. A pleasing incident of the banquet was the reading of a Latin ode composed for the occasion by Professor Maurice Hutton, and of a sonnet by Professor W. H. Ellis, which follows:

From Scotland's mists across the sea you bore
  The sacred fire (kindled by him whose name
  Has made the century famous with his fame),
And bid our lamp burn brighter than before.
Upon our tree, a branch from Scotland's shore
  You grafted, and behold, our tree became
  Wanton in leafage; with blossoms all aflame;
Deep rooted; and with boughs to heaven that soar.
We see the better issue from the strife,
  And hope the best. In loathsome crawling things
  We feel the fluttering of jeweled wings.
In nature's score, with seeming discords rife,
  We seek to read, with you, the note that brings
To harmony the jarring chords of life.

THE SHAW SCHOOL OF BOTANY

THE recently issued administrative report of the Missouri Botanical Garden, and an announcement of Washington University concerning the Henry Shaw School of Botany, indicate that the Shaw foundation is on the eve of entering upon a much increased activity. Although Henry Shaw in 1885 endowed a school of botany in Washington University, to the head of which Professor Trelease was called from the University of Wisconsin, the provision made was practically for only a chair of botany. Four years later, on the death of Mr. Shaw, his fortune, appraised at several million dollars, passed to the care of trustees, for the maintenance of his long established and well known garden and the further development of an institution of research and instruction in botany and allied sciences; the head of the School of Botany being selected as its director.

In the twenty years that have since passed, the trustees of the Shaw estate have been compelled to administer their trust on a maintenance basis, seeing approximately a quarter of their gross income absorbed in general taxes and nearly as much more claimed for street improvements, sewers and similar purposes, a large part of which were entailed by the possession of extensive tracts of unimproved real estate within the city limits. Meantime, the revenue of the School of Botany has sufficed for scarcely more than meeting the undergraduate needs of the university. Nevertheless, maintenance of the garden has been made to include the provision of a good equipment in living plants (11,464 forms), herbarium (618,872 specimens) and library (58,538 books and pamphlets). A part of the time of otherwise indispensable employees has been given to botanical investigation, the results of which are published in a series of annual reports begun in 1890,